# DRT-370D

DIN rail three phase four wire energy meter

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## User manual

## 1.1 Safety instructions

**Information for Your Own Safety**

This manual does not contain all of the safety measures for operation of the equipment (module, device), because special operating conditions, and local code requirements or regulations may necessitate further measures. However, it does contain information which must be adhered to in the interests of your own personal safety and to avoid material damages. This information is highlighted by a warning triangle is represented as follows, depending on the degree of potential danger.

**Warning**

Means that failure to observe the instruction can result in death, serious injury or considerable material damage.

**Caution**

Means hazard of electric shock and failure to take the necessary safety precautions will result in death, serious injury or considerable material damage.

**Qualified personnel**

Commissioning and operation of the equipment (module, device) described in this manual may only be performed by qualified personnel. Qualified personnel in the sense of the safety information contained in this manual are persons who are authorized to commission, start up, ground and label devices, systems and circuits according to safety and Regulatory standards.

**Use for the intended purpose**

The equipment (device, module) may only be used for the application cases specified in the catalog and the user manual and only in connection with devices and components recommended and approved by DMMetering.

**Proper handling**

The prerequisites for perfect, reliable operation of the product are proper transport, proper storage, installation and assembly, as well as proper operation and maintenance. When operating electrical equipment, certain parts of this equipment automatically carry dangerous voltages. Improper handling can therefore result in serious injury or material damage.

- ¾ Use only isolated tools.
- ¾ Do not connect while circuit is live (hot).
- ¾ Place the meter only in dry surroundings.
- ¾ Do not mount the meter in an explosive area or exposed to dust, mildew and insects.
- ¾ Make sure the used wires are suitable for the maximum current of this meter.
- ¾ Make sure the AC wires are connected correctly before activating the current/voltage to the meter.
- ¾ Do not touch the meter connecting clamps directly with your bare hands, with metal, blank wire or other material as you will have the chance of an electricity shock and a possible chance for health damage.
- ¾ Make sure the protection cover is replaced after installation.
- ¾ Installation, maintenance and repair should only be carried out by qualified personnel.

- Never break the seals and open the front cover as this might influence the functionality of the meter, and will void any warranty.

- Do not drop, or allow physical impact to the meter as there are high precision components inside that may break or render the meter measures inaccurate.

**Exclusion of liability**

We have checked the contents of this publication and every effort has been made to ensure that the descriptions are as accurate as possible.
However, deviations from the description cannot be completely ruled out, so that no liability can be accepted for any errors or omissions contained in the information given. The data in this manual are checked regularly and the necessary corrections are included in subsequent editions. We are grateful for any improvements that you care to suggest.

**Subject to technical modifications without notice.**

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## 1.2 Foreword

Thank you for purchasing the Forlong DRT-370D DIN rail three phase four wire energy meter. The Forlong DRT-370D energy meter is the most advanced type electronic kWh meter available at the market. With the Forlong product range we have introduced a large scale of energy meters on the market suitable for 110V AC to 400V AC (50 or 60Hz). Besides the normal energy meters we also developed our own pre-paid meters with chip card, chip card re-loaders and a complete PC management control system. For more information on other product please contact our sales department at forlong@china-meters.com or fyl@china-meters.com.

Although we produce the Forlong DRT-370D meter according to IEC 62053-21 and our quality inspection is very accurate there might always be a possibility that your product shows a fault or failure for which we do apologize. Under normal conditions your product should give you years of benefit and pleasure. In case there is problem with the energy meter you should contact your dealer immediately. All energy meters are sealed with a special seal. Once this seal is broken there is no possibility to claim for warranty. Therefore NEVER open an energy meter or break the seal of the energy meter. The warranty time is 6 months, after production, and only valid for construction faults.

### 1.3 Performance criteria:

| | |
|---|---|
| Operating humidity | ≤ 75% |
| Storage humidity | ≤ 95% |
| Operating temperature | -10°C - +50°C |
| Storage temperature | -30°C - +70°C |
| International standard | IEC 62053-21 |
| Accuracy class | 1 |
| Protection against penetration of dust and water | IP51 |
| Insulating encased meter of protective class | II |

### 1.4 Specifications:

| | |
|---|---|
| Nominal voltage (Un) | 230/400V AC (3~) |
| Operational voltage | 161/279 – 300/520V AC (3~) |
| Insulation capabilities: | |
| - AC voltage withstand | 4KV for 1 minute |
| - Impulse voltage withstand | 6KV – 1.2μS waveform |
| Starting current (Ist) | 0.04A |
| Transitional current(Itr) | 1.0A |
| Minimum current | 0.5A |
| Reference current (Iref) | 10A |
| Maximum current (Imax) | 100A |
| The current measuring range | 0.5-10(100)A |
| Peak current withstand | 3000A for 0.01s |
| Operational frequency range | 50Hz ±10% |
| Internal power consumption | ≤2W / 10VAper phase |
| Test output flash rate (PULSE LED) | 400imp/kWh |
| pulse output rate | 400imp/kWh |

### 1.5 Basic errors:

**With balanced loads**

| | | |
|---|---|---|
| | Cosφ = 1 | ±1.5 |
| 0.1Ib | Cosφ = 0.5L | ±1.5 |
| | Cosφ = 0.8C | ±1.5 |
| 0.1Ib - Imax | Cosφ = 1 | ±1.0 |
| 0.2Ib - Imax | Cosφ = 0.5L | ±1.0 |
| | Cosφ = 0.8C | ±1.0 % |

**With single phase load**

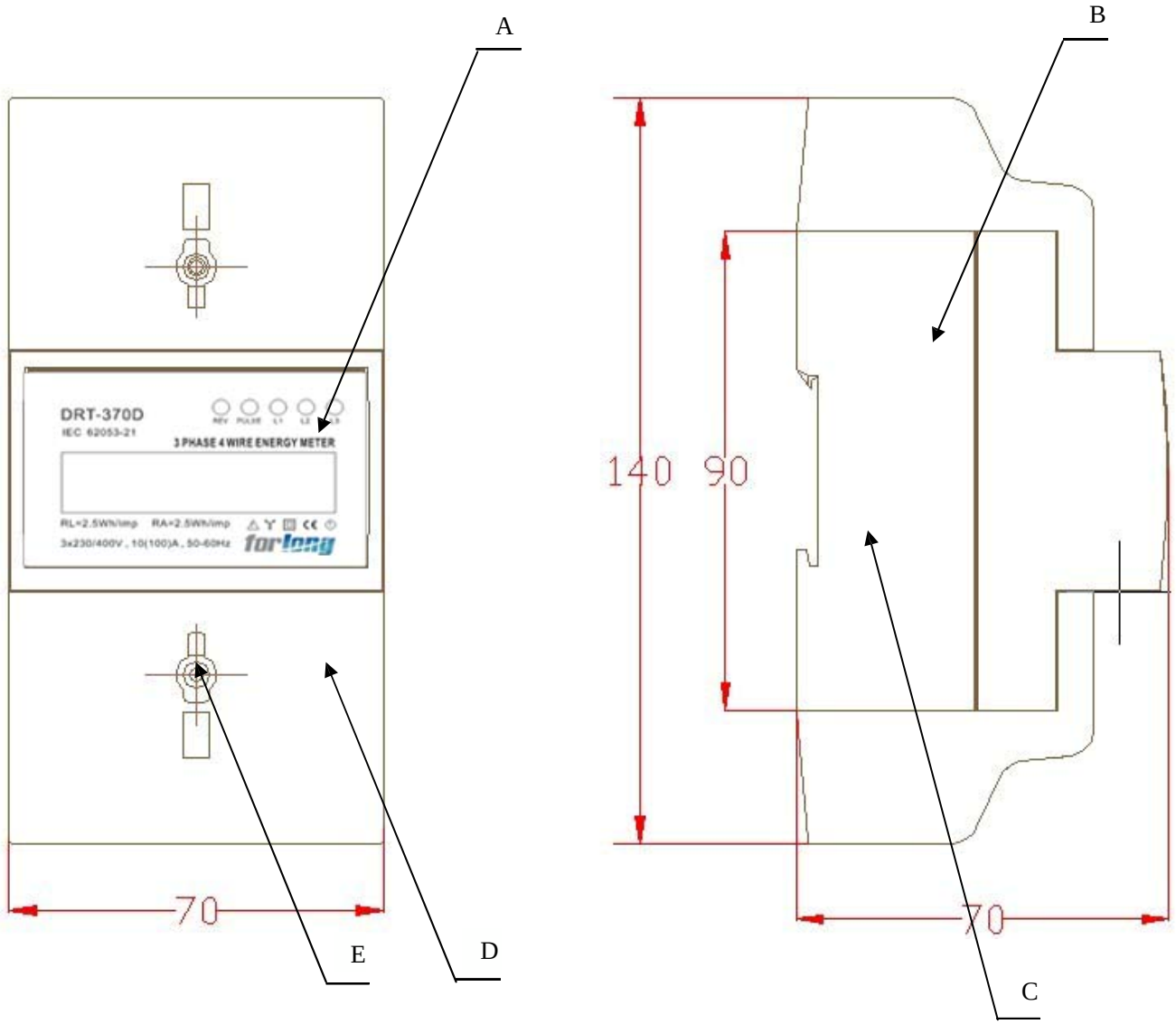
| | | |
|---|---|---|
| 0.1Ib - Imax | Cosφ = 1 | ±2.0 |
| 0.2Ib - Imax | Cosφ = 0.5L | ±2.0 % |

## 1.6 Description

| | |
|---|---|
| A | Front panel |
| B | Cover |
| C | Base |
| D | Protection Cover |
| E | Security hasp |

**Material**

| | |
|---|---|
| Front panel | PC inflammable retarding |
| Protection cover | ABS/PC alloy inflammable retarding |
| Cover | ABS/PC alloy inflammable retarding |
| Base | ABS/PC alloy inflammable retarding |



### 1.7 Dimensions

| | |
|---|---|
| Height | 140mm |
| Height without protection cover | 90 mm |
| Width | 70 mm |
| Depth | 64 mm |
| Size of connection clamp(L×H) | 8×8mm |
| Size of connection clamps(Diagonal) | 11.3mm |
| Weight | 0.42 Kg (net) |

### 1.8 Installation

**⚠ CAUTION**

- ¾ Turn off and lock out all power supplying the energy meter and the equipment to which it is installed before working on it.
- ¾ Always use a properly rated voltage sensing device to confirm that power is off.

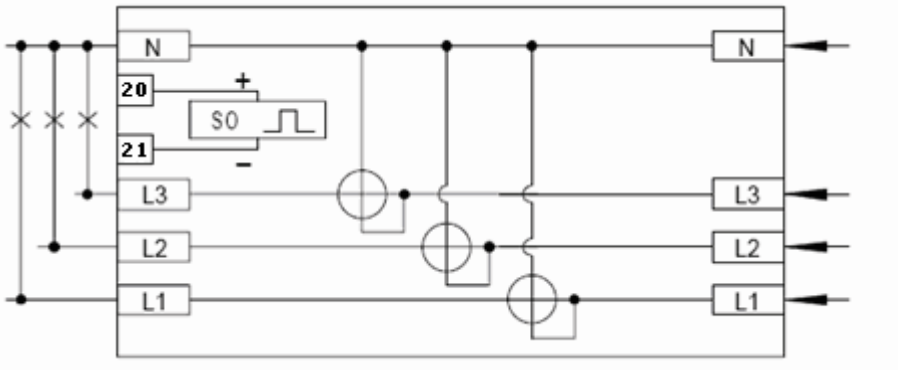
**⚠ WARNING**

- ¾ Installation should be performed by qualified personnel familiar with applicable codes and regulations.
- ¾ Use isolated tools to install the meter.
- ¾ Fuse or thermal cut-off or single-pole circuit breaker can't be fitted on the supply line and not the neutral line.

- We recommend that the connecting wire which is used to connect the meter to outside circuit should be sized according to local codes and regulations for the ampacity of the circuit breaker or over current device used in the circuit.
- An external switch or a circuit-breaker should be installed on the inlet wire, which will be used as a disconnection device for the meter. And there it is recommended that the switch or circuit-breaker be near the meter so that it is convenient for the operator. The switch or circuit-breaker should comply with the specifications of the building electrical design and all local regulations.
- This meter can be installed indoor directly, or in a meter box which is waterproof outdoor, subject to local codes and regulations.
- To prevent tampering, secure the meter with a padlock or a similar device.
- The meter has to be installed against a wall which is fire resistant.
- The meter has to be installed in a good ventilated and dry place.
- The meter has to be installed in a protection box when placed in dangerous or dusty environments.
- The meter can be installed and used after being tested and sealed with a letter press printing.
- The meter can be installed on a 35mm DIN rail.
- The meter should be installed in an available height so that it is easy to read.
- When the meter is installed in an area with frequent surges due to e.q. thunderstorms, welding machines, inverters etc, protect the meter with Surge

Protection Devices

- After finishing installation, the meter must be sealed to prevent tampering.
- Connection of the wires should be done in accordance with the underneath connection diagram.




| | |
|---|---|
| L1 | L1 phase wire |
| L2 | L2 phase wire |
| L3 | L3 phase wire |
| N | Neutral wire |
| 20 and 21 | Pulse output contact |

## 1.9 Operating

**Working indication**

On the DRT-370D's front panel, there are three power indicating LED which have different color from each other. The yellow LED represent L1 phase; the green LED represent L2 phase; the red LED represent L3 phase. When any phases work normally, the LED representation will burn. When any phases have failure or no power, the LED will turn off.

**Consumption indication**

There is a PULSE LED which is used as indicating power consumption in the front panel of DRT-370D When consumption happens, the LED will flash. The more quickly LED flash, the more consumption there is. For this LED, the flash rate is 400 impulses per kWh (2.5Wh/imp).

**Reverse indication**

There is REV. LED on DRT-370D front plate. When meter load current flow is reverse, the LED lighten.

**Reading the meter**

The DRT-370D energy meter is equipped with a 5+2 LCD display which is used as recording consumption and can't be reset to zero. The number system is based on units of 10.And unit is kWh.

**Pulse output**

The DRT-370D DIN rail energy meter is equipped with a pulse output which is fully separated from the inside circuit. That generates pulses in proportion to the measured energy for remote reading purposes and accuracy testing. The pulse output is a polarity dependant, passive transistor output requiring an external voltage source for correct operation. For this external voltage source, the voltage (Ui) should is 5-27V DC, and the maximum input current (Iimax) is 27mA DC. To connect the impulse output, connect 5-27V DC to connector 20 (anode), and the signal wire (S) to connector 21 (cathode). The meter pulses 800 per kWh (1.25Wh/imp).

## 1.10 Troubleshooting

**⚠ CAUTION**

- ¾ During repairing and maintenance, do not touch the meter connecting clamps directly with your bare hands, with metal, blank wire or other material as you will have the chance of an electricity shock and a possible chance for health damage.
- ¾ Turn off and lock out all power supplying the energy meter and the equipment to which it is installed before opening the protection cover to prevent the hazard of electric shock.

**⚠ WARNING**

- ¾ Maintenance or repair should be performed by qualified personnel familiar with applicable codes and regulations.
- ¾ Use insulated tools to maintain or repair the meter.
- ¾ Make sure the protection cover is in place after maintenance or repair.

| Problem | Check | Solution |
|---|---|---|
| No light for the Power supply indicator (L1, L2 & L3 LED). | Is AC power supply connected to the meter ? | Check switch or circuit-breaker and fuse or thermal cut-off. |
| | Is the L1, L2, L3 and N connecting correct ? | Reinstall terminal screws on the L1, L2, L3 and N. Make sure all screws are fixed. Than there should be a 230V 50Hz AC voltage between the terminal screws on the N and L1 or L2 or L3, when power supply is input. |
| | Maybe there is | Please contact technical support to replace this meter. |
| No light for the consumption indicator (PULSE & SOLED). | Is the load running ? | Only when load is running, this LED will flash. |
| | Is the operating power too low ? | If the operating power is too low, the spacing interval of the flashes will take some more time, this is why it seems like the LED isn't burning. |
| | | Please contact technical support to replace this meter. |

Continue.

| Problem | Check | Solution |
|---|---|---|
| The register can't run. | Is there a power supply inside the meter ?<br><br>Is the operating power too low ?<br><br>Maybe there is | Check that the power supply indicator ( L1, L2 & L3 LED ) is burning.<br><br>If the operating power is too low, the spacing interval of the pulses will take some more time, this is why it seems like the register can't run.<br><br>Please contact technical support to replace this meter. |
| No pulse output. | Is DC power supply connected to the meter ?<br><br>Is the connection correct ?<br><br>Maybe there is a fault in the | Check the external voltage source (Ui) is 5-27V DC.<br><br>Check correct connection: connect 5-27V DC to connector 20 (anode), and the signal wire (S) to connector 21 (cathode).<br><br>Please contact technical support to replace this meter. |
| Pulse output rate wrong. | Maybe there is a fault in the inside circuit. | Please contact technical support to replace this meter. |

## 1.11 Technical support

**Any questions, please contact:**

**TEL: 021-60975591/60975592**

**FAX: 021-60975593**

**Email: sale02@china-meters.com**

**www.china-metes.com**